

Before the Federal Communications Commission

IN THE MATTER OF

AMENDING THE DEFINITION OF INTERCONNECTED VoIP SERVICE IN
SECTION 9.3 OF THE COMMISSION'S RULES;

WIRELESS E911 LOCATION ACCURACY REQUIREMENTS;

and

E911 REQUIREMENTS FOR IP-ENABLED SERVICE PROVIDERS

*ON FURTHER NOTICE OF PROPOSED RULEMAKING
AND NOTICE OF PROPOSED RULEMAKING*

**COMMENTS OF THE
NATIONAL EMERGENCY NUMBER
ASSOCIATION**

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GN Docket No 11-117 / PS No 07-114 / WC No 05-196

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COMMENTS OF THE NATIONAL EMERGENCY NUMBER ASSOCIATION

The National Emergency Number Association (NENA) respectfully submits the following comments in response to the *Second Further Notice of Proposed Rulemaking* and *Notice of Proposed Rulemaking* adopted by the Commission on July 12th, 2011, in the above-captioned proceedings.

COMMENTS

- A. The Commission should extend its E9-1-1 rules to cover VoIP services that permit consumers to terminate calls to the PSTN.**

Since the Commission adopted its existing definition of interconnected VoIP service in 2005, the consumer market for such service has changed dramatically. Rather

than an exclusively over-the-top service, VoIP telephony is now offered by a variety of facilities-based providers such as CATV operators, quasi-facilities based providers operating managed IP networks outside the last mile, and true over-the-top providers offering many different types of origination and termination services. These changes have dramatically increased consumer choice in the telephony market and exerted downward pressure on local, long-distance, and international toll pricing. Critical to this rulemaking, however, is the parallel evolution in service marketing and that evolution's impact on consumer behavior.

Services that were once aimed at early-adopters and the international-calling market are now marketed as legitimate and reliable replacements for traditional analog telephone service or "POTS" (Plain Old Telephone Service). While it was initially only facilities-based VoIP providers who marketed their services as true replacements for home telephone service, *non-facilities-based* providers now aggressively market their services to residential subscribers, emphasizing low cost and ease of use as key selling points. Indeed, even services that have not marketed themselves as replacements for POTS are increasingly offering products that emulate the residential POTS experience. For example, one major over-the-top VoIP service provider recently received widespread media attention when it announced the launch of an analog terminal adapter aimed squarely at the residential consumer market.

As service provider marketing has evolved and the cost of consumer-oriented VoIP service has fallen relative to POTS, ever larger numbers of consumers have begun to adopt VoIP as their primary mode of home telephony. Some consumers have turned to facilities-based VoIP providers, most of whom meet the definition of "interconnected" VoIP provider under the 2005 rules: Subscribers of these services can both terminate calls to and receive calls originated on the public-switched telephone network (PSTN). That dual requirement in the

2005 rules, however, has allowed some VoIP services to avoid E9-1-1 service obligations by conceptually bifurcating their service.

Rather than offering integrated origination and termination service, some companies contractually distinguish between their inbound and outbound service. In some cases, this fictitious distinction is maintained even where the two services are marketed together, the consumer cannot purchase one or the other service separately, and inbound calls arrive via the same E.164 telephone number used in the outbound Caller ID string. Importantly, this means that consumers have little or no practical ability to discern the difference between such services and traditional POTS service. This implies that consumers of VoIP service will reasonably expect that such services support 9-1-1 access, an implication borne out by a vast body of experience on the part of NENA's members: NENA members report receiving frantic 9-1-1 calls via mobile telephones or POTS lines after a caller in need has tried and failed to reach 9-1-1 using a non-covered VoIP service. Such situations represent a particular risk to public safety because they delay access to critical emergency response tools such as Emergency Medical Dispatch (EMD) and the actual dispatch of field responders such as police, fire, and EMS units.

Consistent with the current E9-1-1 rules, some bifurcated VoIP service providers have endeavored to reduce consumer confusion about the capabilities of outbound-only and bifurcated services using disclosures and labeling. Although small print, dense contracts, and the well-established proclivity of consumers to ignore product safety warnings may in some cases be overcome by well-designed disclosures, even the best point-of-sale, packaging, or on-product warnings suffer from a key failure: The initial purchaser of equipment or software-based VoIP service, to whom disclosures and warnings will be most visible, may not be the person who attempts to utilize that service in a time of emergency.

Particularly for services that emulate POTS using analog terminal adapters, cordless telephone technology, and Bluetooth-based technology, there may be no way a user other than the purchaser can know that a device that looks and acts just like a traditional telephone is incapable of accessing 9-1-1 or providing accurate location information to a Public Safety Answering Point. For those consumers, the confluence of expectations and failed warnings is particularly dangerous.

Because conceptually bifurcated and outbound-only VoIP services are marketed by providers and perceived by consumers as replacements for residential POTS, NENA considers it imperative that the Commission extend its E9-1-1 service rules to all operators of VoIP services that are capable of terminating a call to the PSTN. Because both bifurcated services and legitimate outbound-only VoIP services have an outbound component, drafting a rule that extends the E9-1-1 service obligations to any provider that permits a consumer to terminate calls to the PSTN would cover both types of services. NENA therefore urges the Commission to adopt rules requiring such providers to comply with the relevant E9-1-1 service obligations including the requirement to properly route calls based on registered location (at minimum) and to supply callback capability, noting that callback capability is already offered by some non-bifurcated outbound-only services in other contexts.

1. The proposed definition of Interconnected VoIP should be modified.

NENA largely agrees with the Commission's proposed modifications to the definition of interconnected VoIP service. In light of improvements in compression technology, it is appropriate for the Commission to modify the second prong of the existing test to encompass services provisioned over any communications medium using IP transport and having sufficient bandwidth to support voice communications with a minimum audio bandwidth at least equal to that of a POTS line. This

change would, for example, include VoIP services operated over dial-up data connections, and would appropriately shift the basis for the classification of certain services away from the characteristics of the physical network over which service is offered and onto the method by which voice traffic is handled.

However, NENA views the proposed use of the term “Internet connection” in the second prong of the test as problematic. Many facilities-based VoIP providers, such as CATV operators, fiber-to-the-home providers, and even LECs offer VoIP services to businesses and consumers over private, managed IP networks. Even though such services are frequently offered in combination with internet access service, some might not fall within the proposed revision of the second prong. Consequently, NENA urges the Commission to again focus on the underlying transport method, rather than the particular network over which the call stream is carried: The rules should refer to IP-based networks, not “the Internet.” To do otherwise would invite a new round of regulatory arbitrage in which facilities-based VoIP providers could avoid E9-1-1 service obligations by segregating their voice networks from the globally routable internet.

Finally, NENA agrees that the fourth prong of the test for interconnectedness should be modified to focus on termination to E.164 telephone numbers. Such a change is in keeping with consumer expectations. Respectfully, however, NENA disagrees that this prong should be limited to *United States* E.164 telephone numbers. As explained above, consumers – particularly those who did not purchase or install a particular service provider’s software or equipment – are unlikely to recognize that what appears to be a telephone or telephony software is incapable of accessing 9-1-1 service. Therefore, NENA urges the Commission to base the fourth prong of the revised test solely on the ability of a service to terminate calls to E.164 telephone numbers.

To summarize, NENA believes that the Commission should extend 9-1-1 requirements to any service that (1) enables real-time, two-way voice communications; (2) requires an IP or similar packetized connection from the user's location; (3) requires Internet Protocol-compatible customer premises equipment (or its equivalent for other packetized services); and (4) permits users to terminate calls to E.164 telephone numbers.

2. *It is technically feasible for outbound-only interconnected VoIP providers to comply with the Commission's E9-1-1 rules.*

In order for an outbound-only VoIP service provider to comply with the Commission's E9-1-1 rules, three capabilities are key: First, the service must support user location registration. Second, it must support location-based routing. Third, it must provide a call-back number at which a PSAP could, in general, expect to reach the caller if the original connection were lost. As the vibrant and fiercely competitive market for VoIP services that are subject to the Commission's E9-1-1 rules under the 2005 test amply demonstrates, providing these capabilities is technically possible. Indeed, some conceptually bifurcated services have voluntarily complied with the Commission's E9-1-1 rules in order to meet consumer expectations about the availability of E9-1-1 through services marketed as replacements for residential POTS.

In particular, NENA believes that outbound-only services could comply with the E9-1-1 service rules for three reasons. First, enabling user location registration is a straightforward matter of establishing and maintaining an appropriate database and tying service activation to validation of registered location information against the relevant Master Street Address Guide (MSAG), all of which are common services available on a competitive basis. Second, location-based routing has been demonstrated both by existing bidirectional VoIP service providers using VoIP Positioning Centers (VPCs)

operated in-house, and by competitive third-party VPCs. Thus newly-obligated service providers would have the option to develop their own in-house VPC, or to contract with an independent vendor for quick deployment. Finally, NENA believes that callback methods already in use by outbound-only VoIP providers (e.g., Skype Caller ID) could permit such providers to supply callback information to PSAPs using, for example, permissibly manipulated Caller ID information.

Because existing technology and market forces make it feasible for outbound-only VoIP services to comply with the Commission's E9-1-1 service rules, NENA recommends that the Commission set an aggressive timetable for compliance. To that end NENA recommends that the Commission require all outbound-only VoIP providers to comply with the E9-1-1 service rules within three to five years.

3. The benefits of extending E9-1-1 service obligations to outbound-only VoIP providers clearly outweigh the costs.

NENA acknowledges that the imposition of E9-1-1 service obligations on the broader class of service providers contemplated by the proposed test for interconnectedness could impose significant costs on those providers. However, NENA believes that the substantial public interest in reliable and ubiquitous access to emergency services through 9-1-1, coupled with consumers' interest in a level competitive playing field for VoIP services outweigh the additional costs that would be imposed upon newly-covered VoIP providers.

Similarly, NENA believes that the cost to PSAPs of accepting calls from these services would also be minimal. Because calls would arrive at a PSAP on existing "analog" time-division multiplexed trunks or SIP trunks from the PSAP's serving end office or VoIP provider, the cost of handling such calls is unlikely to differ from that of handling any other 9-1-1 call – a cost the PSAP is already obliged to bear. Nor would fraudulent or mis-

located calls from such services present a novel or particularly vexing problem for PSAPs: such problems already exist and are adequately addressed through state criminal statutes and telecommunicator training, respectively.

By now, the benefits of access to 9-1-1 service are well established: Faster response times, improved health outcomes due to the use of Emergency Medical Dispatch, and lives saved and property preserved. Balanced against service providers' costs to provide access to 9-1-1 and public safety agencies' costs to handle 9-1-1 calls, these benefits are clearly the greater. Consequently, the costs of providing such service should be no barrier to the extension of E9-1-1 service obligations to out-bound-only VoIP services.

B. The Commission should adopt a generalized location accuracy framework for VoIP service.

As originally conceived, Enhanced 9-1-1 service was based on the ability of LECs to associate a particular access line with address information contained in subscriber databases used for billing and other business purposes. Such databases offer superior location information because fixed infrastructure networks undergo physical changes that could affect the accuracy of location information only rarely and because there exist well-established processes for validating and recording customer information at the time of service installation or activation. Consequently, it was natural for E9-1-1 processes to be based on accessing information held by the access network provider, since the access network (typically, POTS lines) and the originating service (voice telephony) were only offered to consumers as an integrated service.

Now, though, it is possible and even common for originating services such as VoIP to be offered by entities wholly separate from the providers of access networks on which such services are carried. Historically, although broadband service providers have maintained

network endpoint location information in much the same fashion as LECs (many of which are themselves broadband providers), there has existed no standardized process by which applications, devices, or so-called “over-the-top” originating service providers could access that information. Compounding this problem is the general inability of originating service providers to independently discover location information based on reliable means other than user registration.

As recognized by the Commission, considerable effort has been expended by international standards bodies to develop a framework under which access network providers could make network endpoint location information available to location-aware devices, applications, and services. NENA has, itself, incorporated much of that work into its standards for Next Generation 9-1-1: The “i3 solution” assumes the future existence of Location Information Servers in access provider networks and their accessibility by certain standardized protocols (e.g. Location-to-Service Translation or “LoST,” HTTP Enabled Location Delivery or “HELD,” and Dynamic Host Configuration Protocol or “DHCP”). The utility of such information is immediate, however, and the adoption of standardized methods for providing it need not await the deployment of NG9-1-1 systems. Importantly, despite inquiries by the Commission, NENA, and other standards bodies, no viable alternative solution has emerged for providing location information to users of fixed broadband access networks. Nor have access network operators expressed particular concern with the technical or economic feasibility of this approach. NENA therefore encourages the Commission to adopt rules requiring access network providers to make network endpoint location information available using appropriate internationally-standardized protocols and methods within a reasonable timeframe, not to exceed five years.¹

¹ NENA again cautions that although many standards in this space have been developed by, *inter alia*, the Internet Engi-

In addition to that fundamental principle, however NENA also believes that originating service providers have an important role to play in the determination of caller location and its communication to PSAPs. Just as access network providers have unique access to some location information (network endpoint address, for example) originating service providers may have access to equally unique location information derived from other sources such as device-embedded GNSS receivers, WiFi positioning and RF-fingerprinting databases, etc. Over the medium to long term, these technologies will become increasingly important, and NENA urges the Commission to ensure that any final rules do not favor any one location determination method to the detriment of others. Though it may take some time for 9-1-1 processes to evolve the intelligence required to integrate, de-conflict, and process location information from multiple sources, permitting the location technology market to continue its rapid evolution can only benefit the public over the long run.

1. Liability protection should extend at least to all access network and originating service providers.

In order to ensure that a vibrant market exists for public safety communications products and services despite the enormous risks apparent in offering such products and services, NENA has long supported a robust liability protection regime for individuals and companies who choose to enter the market. Because location-based technologies have become the hallmark of high-quality emergency communications services, NENA believes it

neering Task Force, such standards are generally applicable to IP-based networks. Consequently, suggestions that internet-oriented standards should be adopted should not be read to imply that NENA assumes all, or even most, IP-based traffic will necessarily traverse the globally routable internet.

appropriate that the Commission extend liability protection to all access network and originating service providers covered by and in compliance with the Commission's E9-1-1 rules. In addition, the Commission should carefully explore the extent of its jurisdiction over applications and devices capable of supporting ALI for interconnected VoIP services. Although not all devices or applications fall within the historical bounds of the Commission's jurisdiction, their growing importance in the marketplace and significant nexus with wireline and wireless communications means that their performance in an emergency communication context cannot be ignored. Indeed, to the extent that such services are capable of terminating calls to the PSTN and are consequently required to comply with the Commission's 9-1-1 and E9-1-1 rules, NENA believes that such services would qualify for liability protection as "other emergency communications provider[s]" under 47 U.S.C. § 615(a) (Supp. 2011). NENA therefore urges the Commission to issue a Report and Order finding that such services are so covered.

C. The Commission should encourage the adoption and evolution of location-capable broadband technologies.

NENA strongly supports the Commission's undertaking of efforts to encourage the adoption of location-capable broadband technologies. Particularly in the mobile realm, the availability of location information to over-the-top applications will prove crucial to the near- and medium-term evolution of VoIP applications into full-featured, competitive voice services and, most importantly, in their support for critical E9-1-1 service. Currently commercial mobile service providers offer a mishmash of location services, some of which are available for use by location-enabled applications and some of which are restricted to use by the network provider itself or to certain applications "blessed" by the provider. These limitations prevent consumers and the public

safety community from reaping the full benefits of location-capable broadband technologies, and the Commission should encourage mobile broadband providers to provide the maximum degree of location transparency or “low level” access to location data consistent with consumer-determined privacy considerations and sound network management principles, when applicable. Doing so will help to ensure the evolution of emergency communications applications and devices.

1. Location performance benchmarks for devices and applications should be considered by CSRIC in the first instance.

NENA generally supports the improvement of information available to consumers about the emergency calling capabilities of novel devices and applications. Benchmarking could offer consumers a means to compare the location capabilities of, say a WiFi-enabled mp3 player that supports over-the-top VoIP applications and WiFi-based positioning but lacks a GNSS receiver, and a smartphone that supports both circuit-switched voice and over-the-top VoIP and which carries a multi-constellation GNSS receiver in addition to network trilateration software. In order to ensure consistency in the types and meanings of data supplied to consumers and to prevent consumer confusion arising from the complexity of data related to location performance, NENA agrees that the subject of location capability benchmarking should be referred to the Communications Security Reliability and Interoperability Council (CSRIC) for consideration in the first instance. The CSRIC is uniquely qualified to examine this issue due to its composition: Because public safety agencies, equipment vendors, carriers, and device manufacturers are represented in roughly equal proportions, CSRIC is capable of advising the Commission on consensus proposals to accomplish the goals that a benchmarking framework should accomplish. In particular, NENA believes that the CSRIC should consider whether a benchmarking

framework would be valuable to consumers; if so, what information related to capabilities and performance would be most relevant; and, finally, how such information could be presented to consumers in a consistent and understandable format that would inform without confusing.

D. The Commission should initially require some generalized testing for indoor positioning performance.

NENA is pleased that the Commission has referred the question of indoor location accuracy testing to the CSRIC for consideration, and looks forward to the results of that effort. In general, however, NENA believes that some amount of indoor location performance testing will prove to be unavoidably necessary over the medium term. Wireless subscribers increasingly utilize mobile devices as their primary means of communications. As such devices supplant traditional wireline telephone service, consumers are ever more likely to use such devices indoors. The ubiquity of wireless use will likewise generate consumer expectations that a mobile handset can be located by a PSAP during a 9-1-1 call, even if the subscriber is indoors at the time of the call. Indeed, such expectations almost certainly exist already. NENA recognizes, however, that indoor testing, particularly on a network-wide basis, poses significant challenges in terms of access and costs that outdoor location accuracy testing does not. NENA therefore believes that the Commission should consider requiring pilot testing of indoor location performance for a representative sample of each carrier's network, before determining whether broader indoor testing requirements should apply.

Using the results of pilot tests, the Commission could evaluate the real-world performance of various network- and handset-based location technologies. At that point, the Commission could determine whether regular indoor location accuracy testing would be neces-

sary to ensure indoor compliance with the relevant location accuracy standard; whether robust proof-of-concept testing might be substituted for network-wide indoor testing; or whether some differing standard for indoor location accuracy should be adopted, based on the demonstrated ability of a particular positioning technology to produce location information of a given quality. Importantly, it can no longer be said that accurate indoor positioning is not technologically feasible: Companies such as Boeing, TruePosition, Qualcomm, CommLabs, and others now offer products and services that leverage diverse constellations of orbiting and terrestrial beacons and sensors to produce indoor location yields and accuracy that rival previous generations of GNSS-based technologies. Consequently, it is incumbent upon the Commission to establish a testing regime under which such technologies can be evaluated with an eye toward improving access to accurate indoor location information for the public and the public safety community.

CONCLUSION

The Commission should propose final rules consistent with its analysis in the *Second Further Notice of Proposed Rulemaking*, in the *Notice of Proposed Rulemaking*, and with the changes suggested above.

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OCTOBER 2011